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PATTERNS AND CORRELATES OF ALCOHOL CONSUMPTION AMONG AFRICAN-AMERICAN WOMEN

Purpose: The purpose of the present study was to assess patterns and correlates of alcohol consumption among African-American women.

Methods: We used postal questionnaires to collect data in 1995 on alcohol consumption and on demographic, medical, and behavioral factors from 64,500 African-American women aged 21–69 years from across the United States enrolled in the Black Women's Health Study. We used logistic regression analysis to assess the association of consumption with potential correlates.

Results: The prevalence of current drinking was highest (31.1%) among women 40–49 years of age, and lowest (23.1%) among women aged 21–29. In every region, heavy drinking (at least 14 drinks a week), reported by about 8% of current drinkers, was associated with current smoking, lower educational attainment, commencement of drinking at younger ages and, particularly, consumption of greater amounts of alcohol in the early years of drinking.

Conclusion: Alcoholic beverage consumption in later life is strongly related to early patterns. Heavy consumption is associated with smoking and lower levels of education. (*Ethn Dis.* 2002;12:548–554)

Key Words: African-American, Alcohol Consumption, Women

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INTRODUCTION

Heavy consumption of alcohol is associated with injuries, violence, and numerous other adverse outcomes, such as cirrhosis of the liver.^{1–5} A reduced incidence of coronary heart disease in women is associated with moderate drinking⁶ (about a drink a day or less), while in some studies, an increased incidence of breast cancer in White women is associated with moderate and heavy drinking.⁷ An understanding of factors associated with alcohol consumption would be useful in designing intervention programs aimed at reducing alcohol abuse. In addition, factors correlated with alcohol consumption may distort or confound findings from studies of alcohol use in relation to various illnesses, such as breast cancer.⁷ Therefore, understanding of correlates of alcohol use would also aid in judging whether associations between drinking and particular diseases represent causality or the influence of confounding factors.

There have been many studies of alcohol abuse among African-American women, but few of these studied alcohol consumption patterns across a range of Black women.^{8–18} National surveys provide little detailed data on alcohol consumption according to factors other than age, sex, and ethnic group.^{19–22} In the present report, we provide information on patterns of alcohol consumption and the relation of consumption to demographic, medical, and behavioral factors, and to indicators of health con-

sciousness in African-American women. The analyses are based on data collected in the Black Women's Health Study (BWHS) from Black women across the United States.^{23–28}

MATERIALS AND METHODS

The terms "Black" and "African-American" are used interchangeably in this report.

The BWHS is a follow-up study funded by the National Cancer Institute, with its primary objective being to identify risk factors for breast cancer and other serious illnesses among US Black women.^{23–28} The study began in 1995 when 64,524 Black women aged 21–69 years enrolled in the BWHS by completing postal health questionnaires. The questionnaires, along with introductory letters, had been mailed to subscribers of *Essence* (a magazine targeted to African-American women), friends and relatives of early respondents, and members of selected professional organizations. The letter invited participation in the "Black Women's Health Study," which was described as a long-term study of the health of African-American women. We mailed 445,000 questionnaires, and 70,753 (15.9%) women returned completed questionnaires; we excluded women less than 21 years of age or more than 69 years of age, leaving 64,524 participants aged 21–69, 14.5% of the total number of

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questionnaires mailed. We follow the women biannually with postal questionnaires for information on the occurrence of new illness and changes in risk factors. On the 1997 follow-up questionnaire, the women were asked about their race and given a choice of 4 categories: "Black," "White," "Asian or Pacific Islander," and "American Indian or Alaskan Native." The category "Black" was marked by 99.4% of respondents.

On the 1995 baseline questionnaire, the BWHS participants provided information on a large number of factors. The present analyses are based on those data, which included demographic characteristics, level of education, reproductive and medical history, use of selected medications, cigarette smoking, alcohol use, and height and weight. The women were asked "Did you ever drink alcoholic beverages (beer, wine, wine cooler, or liquor) at least once a week for at least a year?" (yes, I drink currently/yes, but I no longer drink/no). Current or ex-drinkers were asked at what age they started to drink alcoholic beverages regularly (<15 years, 15-19, 20-24, 25-29, and 30 or older), how many drinks per week they drank in the first few years that they drank (<1, 1-3, 4-6, 7-13, 14-20, 21-27, 28 or more), and how many drinks of each beverage

(beer, wine or wine cooler, liquor) they drank each week in the past year (<1, 1-3, 4-6, 7-13, 14-20, 21 or more). A drink was defined as 12 ounces of beer, 4 ounces of wine, or 1 shot of liquor. We estimated the total number of drinks consumed per week by adding across beverages, using the midpoint of the reported range for each particular beverage.

We assessed the association of alcohol consumption with factors that we judged might be useful in identifying women at risk of being heavy drinkers, or that might be confounders of alcohol-disease associations. If we had the appropriate data, we included factors identified in previous studies as correlates of alcohol use. The factors assessed included demographic factors, medical factors (eg, history of cancer), behavioral factors (eg, cigarette smoking), and indicators of health consciousness (eg, use of medical care, vitamin use). We derived odds ratios for current drinking and for former drinking relative to never drinking, using multiple logistic regression analysis.²⁹ Similar analyses were carried out among current drinkers for consumption of at least 14 drinks a week relative to consumption of fewer drinks.

RESULTS

BWHS participants were from all regions of the United States (Northeast, 27.8%; South, 30.0%; Midwest, 23.3%; West, 18.9%); 56.2% were less than 40 years of age, 2.5% had completed less than 12 years of education, 43.7% had completed college or a higher level of education, and 27.9% were current smokers (Table 1).

The prevalence of "ever" drinking (current or former drinking) increased with age, from 33.5% at 21-29 years of age, to 52.2% at ages 60-69 years (Table 1). The prevalence of current drinking was lowest (23.1%) among women 21-29 years of age, and peaked (31.1%)

at 40-49 years; current drinking was most common in the West and least common in the South. The largest differences in rates of current drinking were across smoking status and educational level: current drinking was most common among current smokers (49.3%), and prevalence decreased as level of educational attainment increased, from 35.7% among women with <12 years of education to 26.6% among women with ≥17 years. The prevalence of former drinking increased with age, from 10.4% at 21-29 years, to 25.1% at 60-69 years. While women with the least educational attainment had the highest rates of current drinking, they also had the highest rates of former drinking. In addition, women who had given up smoking had higher rates of former drinking than current smokers or nonsmokers. Former smoking was also greater among women who reported having had cardiovascular disease, hypertension, or cancer.

Logistic regression analysis indicated that current cigarette smoking was the strongest correlate of current drinking, followed by former smoking and level of education <12 years (Table 2). For the other variables considered, odds ratios were mostly within the range 0.8 to 1.2. Former drinking was associated with older age, both current and former smoking, lower educational level, and having had cardiovascular disease.

Younger women began drinking regularly at a younger age than did older women, less educated women began earlier than did women with greater educational attainment, and ever smokers began earlier than did never smokers (data not shown). The proportion of women who began drinking regularly before age 15 was 6.6% among women aged 21-29 years, and 1.7% among women aged 60-69 years; 9.0% among women with <12 years of education, and 3.1% among those with 17 or more years; and 5.8% among current smokers, 4.9% among ex-smokers, and 3.2% among never smokers. These relation-

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ships were evident in each geographic region. There was little variation in age at commencement of alcohol consumption by any of the other factors considered in Table 1 (data not shown).

Among ever drinkers, 27.6% reported consuming <1 drink per week in the first few years of regular drinking, 61.4% reported 1-6 drinks per week, and 9.3% reported 7 or more drinks per week. Consumption of at least 7 drinks per week in the first few years of drinking was associated with cigarette smoking (12.3% among current smokers) and fewer years of education (15.5% among women with <12 years of education). There was little variation in the amount consumed in the early years of regular drinking by age or other factors.

The distribution of drinks consumed per week among current drinkers is shown in Table 3. In every age group, at least 75% of drinkers reported consuming fewer than 7 drinks per week. "Heavy" drinking (14 or more drinks a week) was more common among older women (8.4% among women aged 60-69 years) than among younger women (6.1% among women aged 21-29 years) and was associated with current smoking, fewer years of education, earlier commencement of drinking, and greater levels of consumption in the first few years of drinking. These associations were apparent in logistic regression analysis in which consumption of 14 or more drinks per week was compared with consumption of fewer than 14 (Table 4). The associations were also evident in each geographic region (data not shown). The strongest correlate of heavy current drinking was greater consumption of alcohol in the first few years of drinking. None of the other variables considered in Table 1 were significantly associated with heavy drinking (data not shown).

Finally, beer and wine were more commonly consumed at least once a week by younger drinkers; more educated women preferred wine, whereas less educated women and smokers preferred beer or liquor (data not shown).

Table 1. Distribution of current, former, and never drinking (%) among BWHS participants in 1995 according to demographic, reproductive, medical, and behavioral factors*

	N	Current Drinker %	Former Drinker %	Never Drank %
Age (yr)				
21-29	14,686	23.1	10.4	65.3
30-39	21,555	28.2	13.1	57.1
40-49	17,540	31.1	16.3	50.6
50-59	7,663	29.5	20.1	47.5
60-69	3,080	27.1	25.1	43.9
Region				
Northeast	17,959	28.6	14.5	55.3
South	19,371	25.4	14.8	58.0
Midwest	15,013	28.4	15.2	54.9
West	12,181	30.4	14.4	52.1
Education (yr)				
<12	1,614	35.9	29.1	32.2
12	9,754	31.4	19.4	47.2
13-15	23,251	28.8	15.7	54.0
16	14,405	25.2	11.5	62.1
≥17	13,793	26.6	11.5	60.6
Second job				
Yes	11,410	28.0	14.4	56.1
No	50,730	28.1	14.8	55.6
Marital status				
Single	22,153	27.4	12.5	58.8
Married	24,850	26.3	14.7	57.5
Separated/widowed/divorced	16,167	31.9	17.9	48.4
No. of people in household				
1	11,991	30.6	13.7	54.2
2	18,799	29.3	14.8	54.2
3-4	24,558	26.7	14.7	57.1
≥5	7,309	24.8	16.4	57.4
Parous				
Yes	41,022	28.8	16.9	52.6
No	22,248	26.9	10.8	61.1
Cigarette smoking status				
Current smoker	10,259	49.3	18.3	31.3
Former smoker	11,908	39.6	28.4	30.9
Never smoked	40,108	19.4	9.9	69.8
Body mass index (kg/m ²)				
<25	24,420	27.6	11.5	59.3
25-29	19,672	30.1	14.8	53.5
≥30	18,859	26.3	18.6	53.3
Walking for exercise (hr/wk)				
<1	26,156	27.2	14.6	57.0
1-2	18,174	28.7	14.7	55.3
≥3	17,675	28.8	14.9	54.9
Vigorous physical activity (hr/wk)				
<1	30,815	26.7	16.4	55.2
1-2	13,906	28.7	13.4	56.4
≥3	16,862	29.9	12.4	56.3

Table 1. Continued

	N	Current Drinker %	Former Drinker %	Never Drank %
Last visit to an MD				
<1 yr ago	55,750	28.0	15.0	55.6
≥1 yr ago	7,721	28.8	13.2	56.8
Female hormone supplement user				
Yes	9,623	30.9	20.5	46.8
No	52,963	27.6	13.7	57.5
Vitamin A user				
Yes	6,181	33.0	17.6	47.3
No	52,258	27.3	14.2	57.0
Vitamin C user				
Yes	21,154	30.9	16.0	51.9
No	36,497	26.5	13.8	58.7
Vitamin E user				
Yes	14,807	31.9	16.9	49.4
No	44,100	26.6	13.8	58.2
Drug-treated hypertension				
Yes	7,683	28.8	21.7	48.4
No	51,513	27.6	13.3	57.2
Cardiovascular disease†				
Yes	4,744	28.2	24.7	45.2
No	48,892	28.2	13.6	57.5
Cancer				
Yes	932	27.0	22.3	48.1
No	50,253	28.2	14.3	56.8

* Percents do not add to 100% because of unknown values.

† Heart attack, angina, stroke, clots in legs or lungs.

The prevalence of current drinking was lowest (23.1%) among women 21–29 years of age, and peaked (31.1%) at 40–49 years; current drinking was most common in the West and least common in the South.

and women with lower educational levels, and heavier drinkers began drinking at an earlier age compared to lighter drinkers. Heavy current drinking was most strongly associated with higher levels of consumption in the first few years of drinking. These associations with heavy drinking were evident in each geographic region.

The present data refer to alcohol consumption by BWHS participants in 1995. Data on alcohol consumption in the same year among a national sample of African-American women were collected in a study of a probability sample of 4800 White, Black, and Hispanic US men and women.¹⁹ In that study, current drinking was defined as consumption of at least one drink in the previous year. By contrast, the definition of current drinking in the BWHS specified consumption of alcohol at least once a week for at least a year. In addition, the BWHS is not a representative sample; for example, the proportion of BWHS participants with less than 12 years of education is 2.5%, compared to about 15% of a similarly aged national sample of African-American women.³⁰ The prevalences of drinking in the 2 studies are, therefore, not directly comparable, but patterns of consumption within each study can be compared. The national data indicate that the prevalence of drinking among Black women increased until ages 40–49 years and then

DISCUSSION

In the present study of BWHS participants, the prevalence of ever drinking increased with age, from 33.5% at ages 21–29 years to 52.2% at ages 60–69 years. The prevalence of current consumption ranged from a low of 23.1% among women 21–29 years of age to a high of 31.1% of women aged 40–49 years. Younger women began drinking at an earlier age than did older women, but the amount consumed in the first few years of regular drinking varied little with age. Smoking was the strongest correlate of current drinking. Lower educational attainment was associated with current drinking, but less strongly. The many other factors considered in this report, including demographic, reproductive, medical, and behavioral fac-

tors, were weakly associated, if at all, with current drinking. Former drinking was associated with smoking, particularly former smoking, and with lower educational attainment, and with the presence of a cardiovascular disease.

While older drinkers reported consuming greater amounts compared to younger drinkers, at least 75% of drinkers in the BWHS would be considered "moderate" or "light" drinkers, consuming an average of a drink a day or less. This definition of moderate/light drinking is based on the cardiovascular literature, which suggests that women who have one drink a day or less have a reduced incidence of coronary heart disease relative to nondrinkers or heavy drinkers.⁶ "Heavy" drinking (14 or more drinks a week) in the BWHS was more frequent among current smokers

Table 2. Relation of demographic, reproductive, medical, and behavioral factors to current and ex-drinking in the BWHS, from logistic regression analysis

	Current Drinking		Former Drinking	
	Odds Ratio	(95% CI)	Odds Ratio	(95% CI)
Age (yr)				
21-29	1.02	(0.91-1.15)	0.77	(0.67-0.88)
30-39	1.10	(0.99-1.23)	0.76	(0.68-0.86)
40-49	1.18	(1.07-1.32)	0.84	(0.75-0.94)
50-59	1.03	(0.93-1.15)	0.83	(0.73-0.93)
60-69	Ref*		Ref	
Region				
Northeast	Ref		Ref	
South	0.98	(0.93-1.03)	1.14	(1.06-1.21)
Midwest	1.02	(0.96-1.08)	1.05	(0.98-1.12)
West	1.23	(1.16-1.30)	1.14	(1.06-1.23)
Education (yr)				
<12	2.03	(1.77-2.33)	3.00	(2.58-3.48)
12	1.33	(1.25-1.42)	1.68	(1.55-1.83)
13-15	1.12	(1.06-1.18)	1.37	(1.28-1.46)
16	0.98	(0.92-1.04)	1.05	(0.97-1.13)
≥17	Ref		Ref	
Second job	1.00	(0.95-1.05)	1.02	(0.95-1.08)
Single	1.11	(1.05-1.17)	1.11	(1.03-1.18)
Married	Ref		Ref	
Separated/widowed/divorced	1.14	(1.08-1.20)	1.10	(1.03-1.17)
Number in household				
1	Ref		Ref	
2	0.95	(0.90-1.01)	1.00	(0.92-1.07)
3-4	0.85	(0.80-0.90)	0.95	(0.88-1.03)
≥5	0.77	(0.71-0.83)	1.03	(0.94-1.14)
Parous	1.00	(0.95-1.05)	1.14	(1.07-1.22)
Cigarette smoking status				
Current smoker	5.19	(4.92-5.47)	3.32	(3.10-3.56)
Former smoker	4.32	(4.10-4.55)	5.30	(4.99-5.63)
Never smoked	Ref		Ref	
Body mass index				
<25	Ref		Ref	
25-29	1.07	(1.02-1.12)	1.09	(1.02-1.16)
≥30	0.95	(0.90-1.00)	1.28	(1.20-1.36)
Walk for exercise (hr/wk)				
<1	Ref		Ref	
1-2	1.04	(0.99-1.09)	1.03	(0.97-1.09)
≥3	0.96	(0.92-1.01)	1.01	(0.95-1.07)
Vigorous exercise (hr/wk)				
<1	Ref		Ref	
1-2	1.19	(1.13-1.26)	1.00	(0.94-1.07)
≥3	1.26	(1.19-1.32)	0.95	(0.88-1.01)
Last visit to MD ≥1 yr ago	1.00	(0.94-1.06)	0.93	(0.86-1.00)
Female hormone supplement user	1.07	(1.00-1.13)	1.15	(1.08-1.24)
Vitamin A user	1.12	(1.04-1.21)	1.13	(1.04-1.24)
Vitamin C user	1.11	(1.06-1.16)	1.12	(1.06-1.19)
Vitamin E user	1.12	(1.07-1.19)	1.11	(1.04-1.19)
Drug-treated hypertension	1.00	(0.94-1.07)	1.14	(1.06-1.23)
Cardiovascular disease	1.03	(0.95-1.11)	1.47	(1.35-1.60)
Cancer	0.92	(0.77-1.08)	1.17	(0.98-1.41)

* Ref = reference category.

declined, unrelated to marital status. In addition, heavier drinking declined with increasing levels of education. The results from the BWHS validate these findings: drinking in the BWHS increased with age until 40-49 years, and then declined, unrelated to marital status; heavier drinking declined as the level of education increased. In the national data, participation in religion was inversely associated with drinking.¹⁹ Data on that variable were not collected in the BWHS, but the lower prevalence of current drinking among BWHS participants who live in the South, (the "Bible belt"), may partially reflect the influence of this factor.

A strength of the present study is the large sample size of Black women from across the United States. Also, data were available on a large number of potential correlates of alcohol consumption. Limitations should also be acknowledged. The cross-sectional nature of the data introduces uncertainty with respect to temporal sequence. The number of BWHS participants with less than a high school education was small and the results, therefore, apply to women with at least a high school education. However, this criterion includes most similarly aged US Black women since 85% have completed high school.³⁰ It is possible that some women enrolled in the BWHS conditional on alcohol consumption. On the other hand, alcohol use was but one of a large number of items on which information was obtained and it is unlikely that women focused on that single variable. Comparisons within the study should be valid.

Some aspects of drinking differ between Black and White women. A smaller proportion of Black women consume alcohol.¹⁹ The prevalence of drinking overall decreases with level of education among Black women, but it increases with level of education among White women. On the other hand, among both Black and White women, heavier drinking is associated with cigarette smoking and lower levels of education.

Table 3. Distribution of drinks consumed per week among current drinkers in the BWHS according to age, region, education, cigarette smoking, age started drinking, and number of drinks consumed per week in the first few years of drinking

	N	Total Number of Drinks Per Week*				
		<1	1-6	7-13	14-20	≥21
Age (yr)						
21-29	3386	11.9	71.5	10.5	2.8	3.3
30-39	6089	12.2	68.5	11.9	3.6	3.8
40-49	5460	13.1	63.9	14.2	4.7	4.1
50-59	2261	14.9	63.6	14.0	4.2	3.4
60-69	835	15.0	60.2	16.4	5.0	3.4
Region						
Northeast	5139	13.3	67.0	12.1	3.9	3.7
South	4926	11.7	67.8	13.0	3.6	4.0
Midwest	4264	13.2	65.0	13.3	4.2	4.3
West	3698	13.6	66.7	13.1	4.0	2.7
Education (yr)						
<12	579	15.2	50.6	18.7	5.2	10.4
12	3062	13.6	62.4	13.6	4.8	5.6
13-15	6696	12.4	66.4	13.2	4.2	3.7
16	3632	12.7	70.0	11.9	2.9	2.5
≥17	3666	12.2	70.4	11.6	3.5	2.3
Cigarette smoking status						
Current smoker	5056	8.9	60.3	17.9	5.8	7.0
Former smoker	4715	12.8	67.2	13.1	4.0	2.9
Never smoked	7771	15.4	70.5	9.3	2.6	2.1
Age started drinking (yr)						
<15	734	9.8	59.8	15.0	6.1	9.3
15-19	5621	10.3	67.0	13.8	4.1	4.8
≥20	11,480	14.0	67.2	12.3	3.7	2.9
Number of drinks per week in first few years of drinking						
<1	5529	23.5	68.5	5.2	1.4	1.3
1-6	10,876	8.4	69.6	14.9	3.9	3.2
≥7	1406	3.6	38.6	27.0	13.7	17.0

* Percents do not add to 100% because of unknown values.

Information on drinking patterns may be useful in assessing whether observed associations in epidemiologic studies reflect cause and effect, or are the result of confounding. For example, findings from many studies of White women have indicated a small increase in the risk of breast cancer among moderate drinkers.^{7,31} Results have been inconsistent on whether this risk is associated with all beverages or particular ones (eg, wine). It is possible that higher socioeconomic status, which is related both to moderate alcohol consumption and breast cancer risk in White women,³² contributed to the small associations observed. Only one study has as-

sessed alcohol in relation to breast cancer in Black women, and that study found no association.³³ If further studies of alcohol and breast cancer in Black women find a positive association, information on the amount and type of beverage consumed according to years of education should be helpful in assessing the role of confounding.

Finally, while it appears that most US Black women who drink alcoholic beverages do so in moderation, some consume unhealthy amounts.^{13,19} BWHS data indicate that heavy drinkers are disproportionately represented among smokers and women with the least educational attainment. The strong

Table 4. Relation of age, region, education, cigarette smoking, age started drinking, and number of drinks consumed per week in the first few years of drinking to consumption of ≥14 drinks per week among current drinkers in the BWHS, from logistic regression analysis

	Odds Ratio	95% CI
Age (yr)		
21-29	0.70	0.50-0.98
30-39	0.83	0.61-1.13
40-49	1.03	0.77-1.38
50-59	0.89	0.65-1.21
60-69	Ref*	
Region		
Northeast	Ref	
South	1.04	0.89-1.22
Midwest	1.07	0.91-1.26
West	0.95	0.80-1.13
Education (yr)		
<12	1.47	1.10-1.97
12	1.35	1.12-1.64
13-15	1.18	1.00-1.40
16	0.90	0.74-1.11
≥17	Ref	
Cigarette smoking status		
Current smoker	2.14	1.86-2.46
Former smoker	1.18	1.01-1.39
Never smoked	Ref	
Age started drinking (yr)		
<15	2.23	1.76-2.83
15-19	1.28	1.12-1.45
≥20	Ref	
Number of drinks per week in first few years of drinking		
<1	Ref	
1-6	2.39	2.01-2.84
≥7	12.5	10.3-15.2

* Ref=reference category.

associations of heavy drinking in later years with heavier drinking in the early years of drinking and with earlier commencement of drinking suggest that interventions focus on adolescents and young women.

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REFERENCES

- Toomey TL, Wagenaar AC. Policy options for prevention: the case of alcohol. *J Public Health Policy*. 1999;20(2):192-213.
- McGinnis JM, Foege WH. Mortality and morbidity attributable to use of addictive substances in the United States. *Proc Assoc Am Physicians*. 1999;111(2):109-118.
- Brisman B, Bergman B. The significance of alcohol for violence and accidents. *Alcohol Clin Exp Res*. 1998; suppl 7:299S-306S.
- Poldrugo F. Alcohol and criminal behavior. *Alcohol Alcohol*. 1998;33(1):12-15.
- Hill SY. Mental and physical health consequences of alcohol use in women. *Recent Dev Alcohol*. 1995;12:181-197.
- Manson JE, Tosteson H, Satterfield S, et al. The primary prevention of myocardial infarction. *N Engl J Med*. 1992;326:1406-1416.
- Rosenberg L, Metzger LS, Palmer JR. Alcohol consumption and risk of breast cancer: a review of the epidemiologic evidence. *Epidemiol Rev*. 1993;15:133-144.
- Jasinski JL, Williams LM, Siegel J. Childhood physical and sexual abuse as risk factors for heavy drinking among African-American women: a prospective study. *Child Abuse Negl*. 2000;24:1061-1071.
- Caetano R, Cunradi CB, Clark CL, Schafer J. Intimate partner violence and drinking patterns among White, Black, and Hispanic couples in the United States. *J Subst Abuse*. 2000; 11:123-138.
- Humara MJ, Sherman ME. Situational determinants of alcohol abuse among Caucasian and African-American college students. *Addict Behav*. 1999;24:135-138.
- Hines AM, Snowden LR, Graves KL. Acculturation, alcohol consumption, and AIDS-related risky sexual behavior among African-American women. *Women Health*. 1998;27: 17-35.
- Jones-Webb R, Hsiao CY, Hannan P, Caetano R. Predictors of increases in alcohol-related problems among Black and White adults: results from the 1984 and 1992 National Alcohol Surveys. *Am J Drug Alcohol Abuse*. 1997;23:281-299.
- Caetano R. Prevalence, incidence, and stability of drinking problems among Whites, Blacks and Hispanics: 1984-1992. *J Stud Alcohol*. 1997;58:565-572.
- Herd D. Sex ratios of drinking patterns and problems among Blacks and Whites: results from a national survey. *J Stud Alcohol*. 1997; 58:75-82.
- Lozina C, Russell M, Mudar P. Correlates of alcohol-related problems in African-American and White gynecologic patients. *Alcohol Clin Exp Res*. 1995;19:25-30.
- Barthwell AG. Alcoholism in the family. A multicultural exploration. *Recent Dev Alcohol*. 1995;12:387-407.
- Miller JM. Alcoholism in a Black urban area. *J Natl Med Assoc*. 1988;80:621-623.
- Nace EP. Epidemiology of alcoholism and prospects for treatment. *Annu Rev Med*. 1984; 35:293-309.
- Caetano R, Clark CL. Trends in alcohol consumption patterns among White, Blacks, and Hispanics: 1984 and 1995. *J Stud Alcohol*. 1998;59:659-668.
- Dawson DA, Grant BF, Chou SP, Pickering RP. Subgroup variation in US drinking patterns: results of the 1992 National Longitudinal Alcohol Epidemiologic Study. *J Subst Abuse*. 1995;7:331-344.
- Wilsnack SC, Wilsnack RW. Drinking and problem drinking in US women. Patterns recent trends. *Recent Dev Alcohol*. 1995;12:29-60.
- Johnson FW, Gruenewald PJ, Treno AJ, Taff GA. Drinking over the life course within gender and ethnic groups: a hyperparametric analysis. *J Stud Alcohol*. 1998;59:568-580.
- Rosenberg L, Palmer JR, Rao RS, Adams-Campbell LL. Correlates of postmenopausal female hormone use among Black women in the United States. *Obstet Gynecol*. 1998;91: 454-458.
- Rosenberg L, Palmer JR, Rao RS, Adams-Campbell LL. Risk factors for coronary heart disease in African-American women. *Am J Epidemiol*. 1999;150:904-909.
- Palmer JR, Rao RS, Adams-Campbell LL, Rosenberg L. Correlates of hysterectomy among African-American women. *Am J Epidemiol*. 1999;150:1309-1315.
- Palmer JR, Rao RS, Adams-Campbell LL, Rosenberg L. Height and breast cancer risk: results from the Black Women's Health Study. *Cancer Causes Control*. 2001;12:343-348.
- Cozier Y, Palmer JR, Rosenberg L, Adams-Campbell LL. Recent mammography use among African-American women. *Ethn Dis*. 2001;11:188-191.
- Adams-Campbell LL, Rosenberg L, Rao RS, Palmer JR. Strenuous physical activity and breast cancer risk in African-American women. *J Natl Med Assoc*. 2001;93:267-275.
- Schlesselman JJ. *Case-Control Studies: Design, Conduct, Analysis*. New York, NY: Oxford University Press; 1982.
- Educational attainment in the United States. *Current Population Reports*. US Dept Commerce; March 1998. P20-543.
- Willett WC, Stampfer MJ, Colditz GA, et al. Moderate alcohol consumption and the risk of breast cancer. *N Engl J Med*. 1987;316: 1174-1180.
- Kelsey JL, Horn-Ross PL. Breast cancer: magnitude of the problem and descriptive epidemiology. *Epidemiol Rev*. 1993;15:7-16.
- Kinney AY, Millikan RC, Lin YH, Moorman PG, Newman B. Alcohol consumption and breast cancer among Black and White women in North Carolina (United States). *Cancer Causes Control*. 2000;11:345-357.

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